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Microfinance Effects on Borrowers' Poverty: A Case Study on BRAC

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A B S T R A C T

Many parts of the world have been suffering with poverty and some are in extreme form. Microfinance is addressed as an instrument for accelerating financial access to the poor for alleviating their poverty as mentioned in the foremost sustainable development goal. This effort has been operationalized in Bangladesh through BRAC - a prime operator for poverty alleviation. BRAC is presently serving a large number of marginal poor below the poverty level globally. At the onset, governments and donor backed microfinance programs presumed a positive welfare effect on poverty. However, mixed effects are visible in empirical studies. This paper is designed to assess the microfinance effect on BRAC borrowers' poverty at business, household, individual, and security levels. The effect is measured by regressing microfinance on borrowers' poverty using the Household Economic Portfolio Model (HEPM). The results show that microfinance has a significant positive effect on reducing BRAC borrowers' poverty in each of the levels reflected by sixteen different items. Hence, this microfinance program appears to be effective as a development tool to alleviate poverty.

Keywords: BRAC, Borrowers, HEPM Model, Household, Individual, Microfinance, Poverty, Security

Ⅰ. Background

Around the globe, poverty is a severe issue. The parts in the world with extreme prevailing poverty may endanger the rich blessed countries. Sometimes, it may induce unlawful activities leading to violence in its worst form. Being born as a poor is not a crime and it is not in their hand to control most of the time, even though they have been reprimanded for this granted crime they did not commit. Nearly half of the population of the globe (exceeding about three billion) have been living by earning lesser than U.S. $2.50 per day. Of them about 1.3 billion people live in extreme poverty level expending not as much as $1.25 per day. More saddening is that about one billion children across the globe have been plunged in poverty and around 22,000 children die a day because of poverty (UNICEF). These alarming issues are very much related with poverty at grass root level. To solve this poverty for humankind, microfinance might be very effective instrument (Yunus 2007). At sub-national levels supported by international development agencies, microfinance is frequently found to have a positive effect on poverty reduction based on relatively small sample studies (Roth et al. 2016).

The microfinance effort has been regarded as a momentous change in development technique. At the point when the concept matured during the eighties, it was viewed as a trustworthy answer for solving poverty and when it shows due consideration for the welfare of women's

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lives, the engaging quality of the concept is significantly more reformist. Development agencies along with governments begin to apply this model after proper acknowledgement of the microfinance idea during the mid-seventies (Goldstein 2011). However, it is contended that different strategies like the delivery of rudimentary facilities and infrastructures might be more successful to reduce poverty than microfinance. It sabotages the wide range of various strategies of the spectrum by giving focus just on microfinance (Bateman & Chang 2012). Ongoing researches have highlighted the disappointment of microfinance services as a method for development due to high interest rates, alternative use, over indebtedness, etc. (Chhorn 2020).

Microfinance has a portfolio of $ 124 billion with 140 million borrowers across the world. India is the highest followed by Bangladesh, Vietnam, Mexico, Philippines, and other countries by the number of borrowers in 2018. Bangladesh is the pioneer in conceptualizing and applying microfinance ideas. Today over 31 million borrowers (including BRAC) are being served with a loan portfolio of about U.S. $8.0 billion in Bangladesh. Here, modern microfinance has expanded its scope far beyond household activities and self-employment through diversifying borrowers' economic activities. They recognize the heterogeneity among the poor and carefully target and develop customized financial services that best meet their varying needs.

BRAC is a leading provider of financial services for the poor, operating in seven countries including Bangladesh, Pakistan, Tanzania, Uganda, Sierra Leone, Liberia, and Myanmar. BRAC's microfinance activities work through a unique 'credit-plus' approach, addressing the specific needs of various target populations such as rural women, youth and adolescents, landless poor, marginal farmers, migrant workers, urban poor, and small entrepreneurs. BRAC's microfinance members also have access to and benefit from their other development interventions. BRAC's microfinance clients use financial services for a range of reasons, from funding various income-generating activities, to investing in small assets, ensuring stable cash flows for consumption, building up resilience against financial shocks, to simply saving for the future. BRAC has a total enrolment of about 4.19 million borrowers with 279,175 village organization. Its loan portfolio is shown in Table 1.

A rising pattern of microfinance directing a small amount of fund to the people living beneath the poverty line has been watched dominantly for the last few decades.

Table 1. BRAC portfolio

Particulars	Quantity
Village Organization (VO)	279,175 organizations
VO Members	5.84 million members
Total Borrowers	4.19 million borrowers
Dabi Borrowers	3.72 million borrowers
Progoti Borrowers	254, 330 borrowers
Cumulative Disbursement	$ 8175 million
Outstanding Loan	$ 706 million
Repayment Rate	98.76 percent

Still, the appraisals of these sorts of creativities are missing in the existing literatures (Mokhtar 2011). The usefulness of microfinance in decreasing poverty significantly and expanding the welfare of households stays an open question and current literature gives various outcomes (Chhorn 2020). This research has been centered to complement the existing literature by exploring the effect of microfinance on BRAC borrowers' poverty at business, household, individual, and security level. The rest the paper will be offered with an overview of microfinance supportive, adverse and indifferent effect on borrowers' poverty including the theoretical framework. Thereafter, it presents the methodology, result, and discussion followed by conclusions and recommendations.

Ⅱ. Literature Review

A. Microfinance and Poverty

Microfinance has been expected to produce favorable longstanding effects on productivity (Chowdhury 2009). It assumes to be a powerful development strategy to break the vicious cycle of poverty. It begins with the aptitude to lift mass people out of poverty, to empower women, to help those on the edge of society. Yunus (1987) noted that credit is a fundamental human right. This right may be exercised through the operation of microfinance. Microfinance can make this dream come true. Poverty will one day be found only in a museum (Yunus 2007). Microfinance has been envisioned to diminish poverty, encourage job creation, produce earning capability and in the long run help poor people all over the world.

Otherwise, these needy individuals need to take borrowings from neighbor, relatives, friends, or even from local informal money lenders (often quoted loan shark for their extreme terms and conditions) related with very high rate and unfavorable treatment. This sort of informal and casual loan frequently produces serious adverse consequences. But there are mixed research findings in this respect.

A lot of studies have been conducted over the years examining microfinance impact and they produce mixed results (Cautero 2019, Duvendack et al. 2011, Khandker et al. 1998, Roodman & Morduch 2014). Microfinance has not been the silver bullet as it was once considered. Some researchers have revealed that many borrowers consume their loans to cover short term crises rather than address long term development and end up with over-indebtedness. Some found microfinance loans expensive and incur high interest to meet the necessary operating costs of fund providers. It is rarely sustainable among the poor at modest interest rates and very rarely reaches the poorest. It also encourages economic inefficiency. Less consumption demand and unhealthy competition make business catastrophe in poor communities. As a consequence, the majority of new businesses fail within a short time. Many microfinance programs abuse to some extent rather than empower poor people. The collection policy is sometimes heavy-handed which makes some extortion to borrowers' lives. Besides, there is a long-standing issue with exploitive interest rates and many poor are trapped in deepening cycles of poverty and debt as a consequence.

B. Supportive Views

The concept of micro-finance helps marginal poor to fulfill their aspiration which are at the bottom of the ladder. A well-noted empirical work in Bangladesh by Roodman and Morduch (2014) noticed positive effects of microcredit on households. In order to determine microfinance effect Pitt and Khandker (1998) apply a quasi-experimental design. They concluded that, especially in the case of lending to women, microfinance increased household spending. Khandker (2005) argued that microfinance benefited highly poor people much better than relatively poor people through applying panel data analysis. In Bangladesh, numerous researchers have explored the impact of microfinance in their respective studies. As an instance, exploring eighteen hundred borrowers in eighty-six villages, Khandker (1998) showed positive changes in various variables such as income, consumption, expenditure, savings, wealth accumulation, employment generation, etc. He also enumerated that about five percent of the borrowers annually get out of poverty by their individual communities.

Some other researchers like Hashemi, et al. (1996) and Husain (1998) observed a similar form of positive effect on borrowers in Bangladesh attributable to microfinance. Many of these scholars claimed that microfinance supported people below the poverty line with comparatively decent lives and brought them at least to poverty reduction, or even out of poverty. The supply or lending side of the system is under the jurisdiction of microfinance. It provides the poor with small credits to start income-generating activities that help them accumulate resources along with increasing standards of living (Littlefield et al. 2003). Milton Friedman, recipient of the Nobel Prize in Economics in 1976, cited "The poor remain poor not because they are lazy but because they do not have access to money" (Smith & Thurman 2007).

C. Adverse Views

Contradictory effects of microfinance have created enduring doubt of the development strategy. Morduch (1999) along with Pitt and Khandker (1998) found no effect on the amount of borrowers' spending using simple predictors. However, they observed that microfinance decreased consumption uncertainty. Different researchers were of the opinion that microfinance did not succeed for its intended purpose but rather, it failed to accomplish its goal in different aspects (Duvendack et al. 2011, Hickel 2015). All these researchers argued that microfinance often produced more suffering and borrowers ended up with worse results. A significant explanation was that, instead of engaging in revenue-generating programs, often borrowers diverted their loans to pay for their basic consumption. This diversion of the loan caused a stalemate in the generation of their income. Therefore, they sunk themselves into further debt as a consequence.

In South Africa, 94 percent of all microfinance credits had been redirected from the planned purpose of alleviating poverty to some other purpose (TRT.World 2017). This generated the condition where borrowers had not been

interested in income generation with their initial loan. As a result, to pay off the current debt obligation and so forth, they again needed another debt. With more loans, this plunged them deeper down and made the situation worse, and, in some cases borrowers committed suicide (Taylor 2011). Even a significant claim was that the microfinance net effect against poverty in the developing world had been observed to be nearly zero (Hickel, 2015). Bateman's (2010) controversial and provocative analysis revealed that microfinance did not really work for its intended purpose, rather it created hype on half-truths, and it worked for those people promoting and working for microfinance. In addition, it demonstrated that it really created an important blockade to sustainable socio-economic development. Hulme (2000) noted that microfinance did not even scratch the surface of poverty outside Bangladesh.

D. Mixed Views

In different periods and locations around the globe, microfinance effect assessments have been reported with different findings. A number of research outcomes triggered a stalemate situation and suggested further researches to determine microfinance effect. They showed poor linkages between microfinance and poverty alleviation when systematic or repeated exercises had been performed (Roodman & Morduch 2014). Microfinance when used properly, however, could act as an effective tool to alleviate poverty for poor people usually unserved or underserved for financial services (Cautero 2019). Over the past few decades, policymakers and donors had supported it as a responsibility, both economically and even politically. While there were several cases of positive outcomes of microfinance, there were also negative reports for borrowers with loans which made their welfare much worse.

In recent years, finding out microfinance effect for poverty alleviation had been most important arguable subject (Duvendack et al. 2011). Poverty mitigation might undercut the microfinance key goal, however, social promotion, emancipation and inclusion could be extended as the domino effect and microfinance needed to be continued instead of tenacious difficulties and mismanagement (Milana & Ashta, 2012). Bhuiya et al. (2016) studied borrowers wellbeing through household income and consumption in their econometric analysis and indicated that increase in the duration of microfinance borrowing was associated with an increase of income and consumption. Pitt et al. (2006) pointed out that effects of microfinance differ significantly for borrowers of different gender and noted that women were performing much better than men.

Rahman et al. (2015) found microfinance has increased income, general expenditures, and savings and also confirmed that relatively high-income borrowers experienced more benefits and women gained greater access to decision-making. Woller and Parsons (2002) concluded favorable community economic impact through associating microfinance with regional income multipliers. Roodman and Morduch (2014) showed that microfinance decreased poverty with the hope of possibility which was not confirmed through randomized controlled trials. After dropping outliers, even the original results on poverty alleviation did not appear. Microfinance might have positive effect for its well design and target to subset of poor people but not for all and it needed to be complemented rather than replaced with other development tools (Sinclair, 2012). However, many researchers conclude that there is a significant positive effect for some few development indicators, whereas, it is not true for other development indicators.

Through providing small loans to borrowers, De Mel et al. (2008) measured the increase in profits arising from this exogenous shock to capital stock and found the average real return to capital substantially higher than the market interest rate. Ghalib et al. (2015) revealed that microfinance had positive effect on the borrowers' households for indicators such as healthcare, clothing, water supply, house quality etc. Imai et al. (2010) examined whether household access to microfinance reduced poverty and found significant positive effect of productive loans on multidimensional welfare indicator despite some limitations arising from potential unobservable important determinants of access to microfinance institutions. Mukherjee (2015) examined whether the government subsidized microfinance program has been able to expand physical, economic, political and socio-cultural spaces across castes, creeds and beliefs and found success in effecting upon physical, economic and political components of empowerment, but has failed to expand socio-cultural spaces.

Despite the latest crisis within the microfinance industry, it continued to expand as a key development tool. Van et al. (2012) considered financial outcomes (e.g., income, savings, expenditure and assets), as well as, non-financial outcomes (e.g., health, nutrition, food security,

education, child labor, women's empowerment, housing, job creation, and social cohesion) and they found indifferent effect showing that microfinance does harm, as well as good, to the livelihoods of the poor. Some researchers did not agree for the same indicators rather put positive effect on some other indicators (McIntosh et al. 2011). Further, Lascelles and Mendelson (2012) observed that because of inadequate proof for positive effect, micro-finance may be losing credibility.

Ⅲ. Microfinance Theory, Models and Variables

A. Microfinance Theory

The theories behind microfinance tell us how it is effective in the application toward borrowers. These theories were quoted by Osmani and Mahmud (2015) in three systematic ways. These are (i) theories relating to incentives (moral hazard), (ii) theories relating to screening (adverse selection) and (iii) theories relating to contract (contract enforcement). Moral hazard has been tackled though group-lending approach used in microfinance to oblige the borrowers putting relatively higher degree of effort for the fruitful result. It makes the borrowers morally responsible through behaving in desirable way by selecting the suitable schemes. The microfinance as a loan market may operate in odd or unusual ways when the data is asymmetrical between lenders and borrowers.

Adverse selection is presumed as a market disappointment for selecting wrong type of borrowers. This has been tackled through joint liability lending to prevent adverse selection, which leads to better credit market efficiency. Contract enforcement issue arises when borrowers have made the target returns but do not want to repay back the loan. The revenue generating activities supported by microfinance go well but there is no formal contract between lenders and borrowers which can make them bound to pay back. Since collateral is absent, there is not much in the lenders hand to do anything legitimately for execution. This issue has been tackled thorough threatening borrowers with no further credit in future. The borrowers might be induced to consider the future availability of loans as the lenders are capable of making the threat credible. When a borrower is concerned with microfinance, all these theories are believed to be in operation. The implementation of these theories in the field, whether they work or not for poverty alleviation, is worth exploring.

B. Micro-finance Model in the Study and Variables

In this study, Household Economic Portfolio Model (HEPM) is used to overcome shortcomings in microfinance effect evaluation. The main function of the HEPM model is to get rid of overestimating one particular indicator of borrowers' welfare. The HEPM evaluates microfinance effect through three levels: (i) business, (ii) household and (iii) individual (Chen and Dunn 1996). The household resource components include human household resources (i.e., time, labour, and skills), physical household resources (i.e., land, construction, tools & equipment, and raw materials) and financial household resources (i.e., cash and cash equivalents). In microfinance effect assessment, fungibility produces more challenges than other concerns. This is far more significant than endogeneity and selection bias. Nonetheless, fungibility can be resolved through the HEPM model by assessing the impact of microenterprise services (Khalily 2004).

For the individual member of the corresponding household, all the above listed resources can belong either individually or collectively. The resource can be obtained from either an informal entity or a formal institution or even from the network existing in the society. There should be some household activities consisted of production, consumption and investment, after receiving loan from microfinance institution. Production household activities includes income generating, household maintenance and outdoor activities. Consumption household activities include basic amenities together with ceremonies and amusements, and investment household activities include real property, productive assets, physical storage of wealth, human resource development through education and training. The revenue generated from these activities would flow into domestic belongings. The HEPM system becomes operational by considering all perspectives of the borrower's domestic activities (Figure 1). Since all components have been interrelated with each other, HEPM recommends that microfinance effect assessment should be carried out on all of them simultaneously. Therefore,

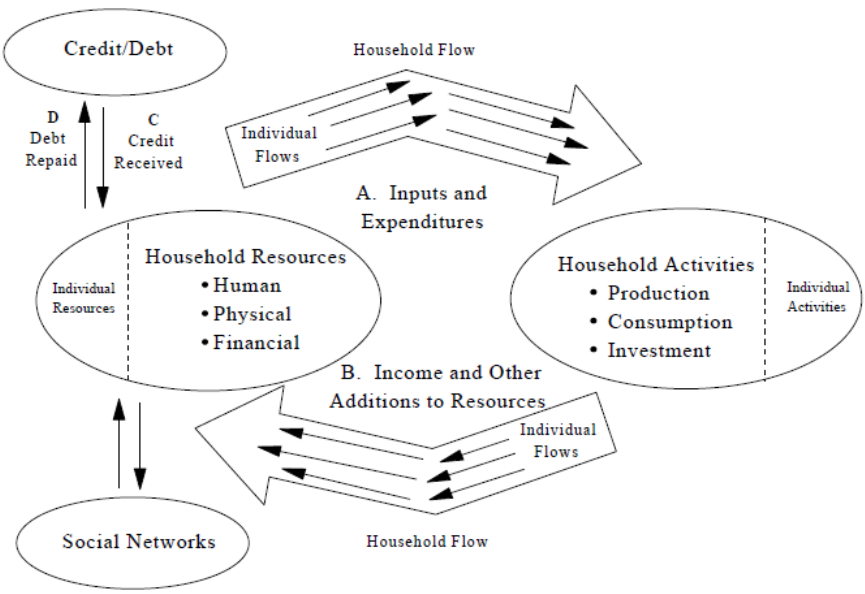

Figure 1. Household Economic Portfolio Model (Chen and Dunn 1996)

effect assessment has been studied at microenterprise level, household level and individual level as well.

Poverty, the dependent variable in this study, is characterized by different poverty variables in conjunction with Household Economic Portfolio Model. Poverty is measured in relative terms rather than in absolute terms. For instance, business revenue has been considered as the poverty variable in the business level effect measurement of microfinance. After at least one year of microfinance intervention, we measure whether a participant borrower's opinion about business revenue increased or not compared to non-participant borrowers. If a participant borrower agrees there is more business revenue increment compared to a non-participant borrower, she is better off towards poverty alleviation. An opinion can be formed that microfinance has a positive effect on poverty holding other things constant.

In line with the aforesaid HEPM, we add one more level for the effect assessment with microfinance intervention. This is the security level, which is further split into borrowers' social security, financial security, food security, and health security. Finally, this study intends to measure borrowers' poverty for microfinance intervention and we also intend to measure this type of effect assessment quantitatively.

Ⅳ. Study Method

In this study, microfinance is taken as an explanatory (independent) categorical variable that takes two levels: (i) a treatment group with microfinance intervention, and (ii) a control group without microfinance intervention. Loan is given to participant borrowers (treatment group) by their concerned microfinance institute (BRAC), for producing revenue-generating activities. This treatment group comprises of those poor people who are successful with their loan application through fulfilling all the criteria set by the BRAC. Conversely, loan is not given to non-participant borrowers (control group) by the respective microfinance institute (BRAC) for creating revenue-generating activities. This control group comprises of either those poor individuals with failed loan application for not satisfying all the conditions set by BRAC, or those individuals who want loans but are unable to go further for their respective obligations.

An experimental treatment group (participant borrowers) has been compared with a control group (non-participant borrowers) in this study. To overcome the selection bias for this study, due effort has been given so that all the respondents are comparable on the same socio-economic background. After one-year of microfinance inter-

vention, the participant borrowers are compared with non-participant borrowers regarding their business activities, household conditions, personal affairs and security issues. Both the groups have been asked, after one year they receive microfinance loan or otherwise operating without such loan, whether their respective positions in *business*, *household*, *individual* and *security* level have any effect. In the survey questionnaire, the borrowers are asked to give their agreement in a five point Likert scale (1: Strongly disagree, 2: Disagree, 3: Neutral, 4: Agree, 5: Strongly agree) that microfinance creates an effect on the items under business, household, individual and security level selected for this study (Appendix 1).

This study used the exploratory concept (opposing to confirmatory concept) to measure microfinance effect on borrowers' poverty represented by multidimensional items. This method explores whether multifaceted poverty items prove valuable for covering the research question asked. Exploratory analysis used to this data set assists to comprehend the relationship to condense a wide number of items to one poverty construct. However, we used some prior knowledge through HEPM that helped to choose items for poverty construct. To find out whether there is a significant effect of microfinance on borrowers' poverty (construct or latent variable), the study took four items for each aforesaid level (business, household, individual and security) to operationalize the HEPM framework as follows:

1) Business level: Business Revenue, Fixed Asset, Current Asset, Employment
2) Household level: Household Income, Immovable Property, Movable Property, Expenditure
3) Individual level: Control, Honor, Capacity, Confidence
4) Security level: Social, Financial, Food, Health

To be definite, multivariate measurement involves using multiple items to build a construct. Using multiple items to quantify poverty construct is more likely to represent all the diverse features within the concept with precision (Appendix 2). Nevertheless, even using multiple items may also retain some degree of error. Under the backdrop of aforesaid literatures, the following hypothesis has been developed for microfinance causal impact on borrowers' poverty.

H_o: Microfinance causes significant positive impact on borrowers' poverty at business, household, individual and security level.

Structural Equation Modeling (SEM), used in the study, helps us to overcome many limitations and shortcomings and enables us to incorporate unobservable variables measured indirectly by indicator variables. It also assists incorporating error in observed variables (Chin 1998). Between Covariance-Based SEM (CB-SEM) and Partial Least Squares SEM (PLS-SEM), this study applied PLS-SEM to explore the relationship between microfinance and poverty. This helps through focus on explaining the variance when examining the model. Furthermore, the PLS model provides much more stable results than the OLS model (Farahani et al. 2010). PLS-SEM initially focuses on the measurement model, and later on the structural model. *Measurement model* brings empirical measures of the relationships between indicators and constructs by evaluating the reliability and validity of the construct measures. *Structural model* brings the same among constructs. These measures enable us to compare microfinance theory with reality. Alternatively, it would tell how well microfinance theory fits into the studied area. This study used reference values cited by Ramayah et al. (2018) for both the measurement model and structural model for significance (Appendix 3).

The survey for this study was conducted during the year 2019 (through questionnaire survey). Sample size was determined using G*Power, which predicted 365 respondents for this research. However, to be on a safer side, the studied sample size is 400. Aided by the interviewer with the questionnaire, borrowers' responses were collected mostly at the time of their weekly meetings. Also, borrowers were intercepted at their business, household, training, meetings of their convenience and accessibility. In each of the four greater divisions of Bangladesh (Rajshahi, Dhaka, Khulna and Chittagong), four zones were randomly selected. From each of the zones 25 respondents were chosen at random, making total respondents equal to 400. Interviewer aided face to face questionnaire surveys were conducted with both groups of the participant and non-participant borrower respondents (Table 2).

Table 2. Details of sample distribution

Divisions	Total number of Zones	Number of randomly chosen zones	Sample from each zone	Total sample from each division
Dhaka	13	4	25	100
Rajshahi	11	4	25	100
Chittagong	7	4	25	100
Khulna	9	4	25	100

V. Results and Discussion

This section discusses microfinance impact on borrowers' poverty at four levels: business (business revenue, fixed asset, current asset and employment), household (household income, immovable property, movable property and expenditure), individual (control, honor, capacity and confidence) and security (social, financial, food and health). All the calculations are done using Smart PLS. Regression analysis has been performed using partial least square (PLS) with reflective measurement model (RMM) taking microfinance as an independent variable and poverty as dependent variable. Poverty is measured through four latent variables reflected by four items at business, household, individual and security levels. Analysis regarding measurement model and structural model are detailed below.

A. Measurement Model

Mentioning reference values for PLS-SEM modelling (Appendix 3), it is noted that Composite Reliability (CR) (between 0.70 ~ 0.90) confirms satisfactory internal consistency (Table 3). Also values of Factors Loadings (FLs) (> 0.40) and Average Variance Extracted (AVEs) (> 0.50)

Table 3. Measurement model

Construct	Items	Internal consistency	Convergent validity		Discriminant validity
		Composite reliability (CR)	Factor loading (FL)	Average variance extracted (AVE)	Heterotrait-Monotrait ratio (HTMT)
Microfinance		1.000	1.000	1.000	0.807
Business Level	Business revenue	0.764	-	0.624	-
	Fixed asset		-		
	Current asset		0.662		
	Employment		0.899		
Household Level	Household income	0.740	-	0.588	0.984
	Immovable property		-		
	Movable property		0.791		
	Expenditure		0.742		
Individual Level	Control	0.754	-	0.606	0.780
	Honour		-		
	Capacity		0.801		
	Confidence		0.755		
Security Level	Social	0.752	-	0.504	0.863
	Financial		0.620		
	Food		0.763		
	Health		0.739		

confirms convergent validity. Fornell-Larcker Criterion, Cross Loadings and Heterotrait - Monotrait Ratio (HTMT) have also met the threshold levels confirming discriminant validity. Considering the PLS output results and HEPM, the study excluded business revenue and fixed asset at business level, household income and immovable property at household level, control and honour at individual level, and social security at security level (Figure 2). Items with weaker outer loadings are sometimes retained on the basis of their contribution to content validity (Hair et al. 2016). This HEPM has been applied by Dunn and Arbuckle (2001) to evaluate microfinance impact assessment. It deals with poverty as a content through different aspects at the business, household, individual, and security level and suggests to explore these items for avoiding fungibility.

B. Structural Model

The structural model statistics for testing the hypothesis are detailed in Table 4. The estimated path coefficients of microfinance on poverty at business (0.551), household (0.376), individual (0.409) and security (0.726) level are found statistically significant ($p<0.000$). These path coefficients can be interpreted just as the beta coefficient like the estimated change in the dependent variable for a unit change in the independent variable. This means participant borrowers are estimated to be 0.551, 0.376, 0.409 and 0.726 times better off in poverty at business, household, individual and security level respectively compared to non-participant borrowers. The coefficient of determination (R^2) of microfinance on poverty at business (0.303), household (0.142), individual (0.168) and security (0.527) level can be considered weak to moderate. Corresponding f^2 (0.435, 0.165, 0.201 and 1.115 respectively) indicate that microfinance has small to medium effect in producing the R^2 for poverty. Besides, the predictive relevance of the model has been examined by checking the Q^2 values (0.179, 0.079, 0.097 & 0.253 > 0), indicates that the model has sufficient predictive relevance.

Considering both measurement and structural models, it can be concluded that microfinance has a significant positive impact on BRAC borrowers' poverty level. This

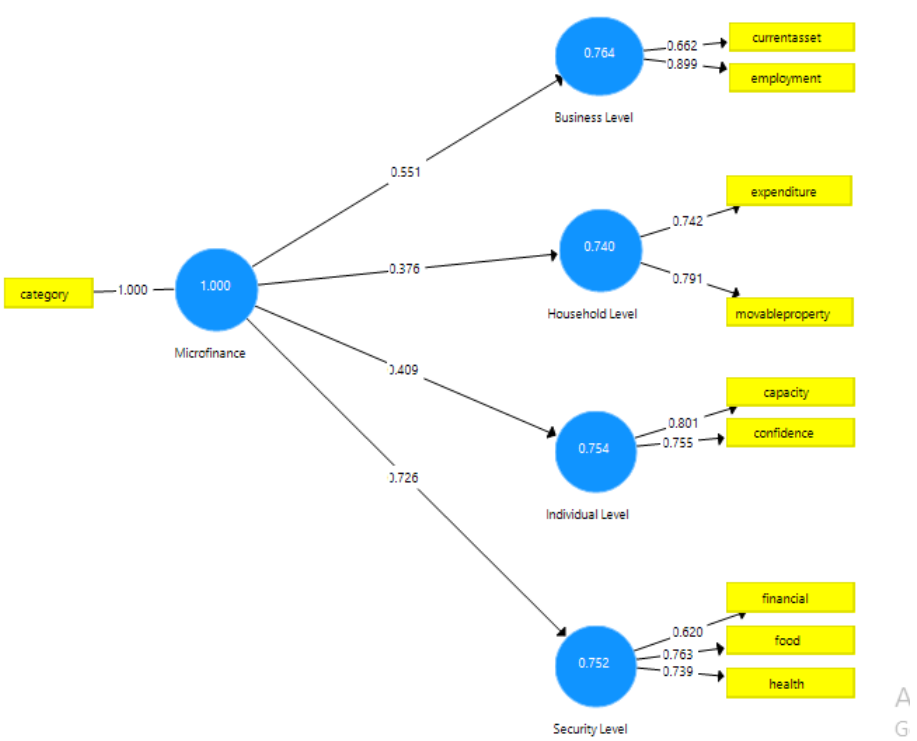

Figure 2. Causal Relationship between Poverty and Four Latent Variables

Table 4. Structural model

Hypothesis (H1)	Relationship	Std. Beta	Std. Dev.	T-value	Decision	R^2	f^2	Q^2
MF causes significant impact on borrowers' poverty at four different levels	Microfinance→ Business Level	0.551	0.024	22.844***	Supported	0.303	0.435	0.179
	Microfinance→ Household Level	0.376	0.030	12.664***	Supported	0.142	0.165	0.079
	Microfinance→ Individual Level	0.409	0.030	13.795***	Supported	0.168	0.201	0.097
	Microfinance→ Security Level	0.726	0.015	48.047***	Supported	0.527	1.115	0.253

Note: *** $p < 0.01$

finding is consistent with a number of studies (Khandker 1998, Mamun 2017). They found positive evidence for microfinance by different variables like income, consumption, expenditure, savings, employment, etc. Khandker (1998) also concluded that about five percent of the borrowers got rid of poverty by their respective categories per year. Similarly, positive impact on borrowers' poverty was found for microfinance intervention (Hashemi et al. 1996; Husain 1998).

Ⅵ. Summary, Conclusions and Recommendations

This work has been structured to complement the existing literature by exploring the effect of microfinance on BRAC borrowers' poverty at business, household, individual, and security level. In this study, Household Economic Portfolio Model (HEPM) is used to overcome shortcomings in microfinance effect evaluation, mainly to get rid of overestimating one particular indicator of borrowers' welfare. Using multiple items to quantify poverty is more likely to represent all the diverse features within the concept with precision. The items included in business level are business revenue, fixed asset, current asset & employment; in household level are household income, immovable property, movable property & expenditure; in individual level are control, honor, capacity and confidence and in security level are social, financial, food and health security.

Microfinance is taken in two forms: (i) a treatment group with microfinance intervention, and (ii) a control group without microfinance intervention. Loan is given to participant borrowers by their concerned microfinance institute (BRAC), for producing revenue-generating activities. This study used the exploratory concept to measure microfinance effect on borrowers' poverty represented by multidimensional items. This method explores whether multifaceted poverty items prove valuable for the microfinance they have taken. Under the backdrop of literatures, the study hypothesized that microfinance causes significant positive impact on borrowers' poverty at different levels. The interviewer aided questionnaire survey for this study was conducted during 2019 on 400 microfinance borrowers, mostly at the time of their weekly meetings. Borrowers were also intercepted at their business, household, training, meetings of their convenience and accessibility. The respondents were chosen from all the greater four divisions of Bangladesh.

Partial Least Squares Structural Equation Modeling (PLS-SEM), used in the study, helps to overcome many limitations and shortcomings and enables to incorporate unobservable variables measured indirectly by indicator variables to explore the relationship between microfinance and poverty. This focuses on explaining the variance when examining the model. PLS-SEM initially focuses on the *measurement model* and later on the *structural model*. *Measurement model* brings empirical measures of the relationships between indicators and constructs by evaluating the reliability and validity of the construct measures; *Structural model* brings the same among constructs. These measures enable us to compare microfinance theory with reality. Considering the PLS output results and HEPM Model to evaluate microfinance impact assessment on poverty as a content, the study excluded business revenue and fixed asset at business level, household income and immovable property at household level, control and honor at individual level, and social security at security level.

The structural model for testing the hypothesis showed that the estimated path coefficients of microfinance on poverty levels are found statistically significant. The model has sufficient predictive relevance. Considering both

measurement and structural models, it can be concluded that microfinance has a significant positive impact on BRAC borrowers' poverty level.

Everybody should be given an opportunity to become a successful entrepreneur as this study finds that microfinance has a significant positive impact on borrowers' poverty at different levels. BRAC gives the small value of assets in the form of microfinance loans and some training to operate those assets. After providing money and technology, we find these poor people end up with more assets and more earning from those assets. It ultimately increases their consumption and positive outlook for lives. This is a good argument that microfinance may work to a certain extent.

The problem of microfinance includes financing tiny enterprises and they do not make much money and are usually without paid staff and with few operating assets. It is not impossible to have a self-sustaining big business with microfinance but there are few examples and special cases. Although microfinance is important in helping the poor survive, it would not be wise to rely on it for a mass exit from poverty. As a solution for global poverty, microfinance gives hope for poverty elimination by providing financial services to the poor. It gains the attention of most international development organizations, governments, the United Nations, and the World Bank devoting huge resources to promoting it. Sometimes, it has been treated as a political means to appeal to supporters, especially non-poor people. However, microfinance is also subject to corruption and abuse. A series of catastrophes sparked the crash of microfinance in India and other parts of the world and the dark side of microfinance was uncovered. Policymakers need to support the industry by creating funds, formulating rules, and making regulations for both borrowers and industry. Microfinance seems favorable for both governments and for the welfare of their respective people

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Microfinance Effect on Borrowers' Poverty: A Case Study of BRAC

This survey is designed to find out whether microfinance is working for poverty alleviation. The information provided will be completely confidential and will be used exclusively for academic purpose. This will not be associated with your normal activity of life or create problem in any way. This survey will ask several questions about yourself and your family together with microfinance impact on your business, household, individual and security level at different perspectives. Your cooperation in this regard will be appreciated.

I. Please tick the right Identification (Borrower Category)

A. Participant Borrower (With Microfinance) b. Non-Participant Borrower (Without Microfinance)

II. Please give your agreement in a scale of 1 (Strongly disagree) to 5 (Strongly Agree) to the following statements.

Appendix 1. Survey questionnaire

Variables of different levels	Strongly agree (5)	Agree (4)	Indifferent (3)	Disagree (2)	Strongly disagree (1)(5)
A. Business level					
Your business revenue has been increased.					
Your business fixed asset has been increased.					
Your business current asset has been increased.					
Your business has created employment.					
B. Household level					
Your household income has been increased.					
Your household immovable property has been increased.					
Your household movable property has been increased.					
Your expenditure on basic amenities has been increased.					
C. Individual level					
Your control has been increased.					
Your honor has been increased.					
Your capacity has been increased.					
Your confidence has been increased.					
D. Security level					
Your social security has been increased.					
Your financial security has been increased.					
Your food security has been increased.					
Your health security has been increased.					

Thank you for your cooperation!

Appendix 2. Constructs and items development for causal impact

Construct/Type	Variable	Conceptual definition	Operational definition	Measurement Item	Technique of development	Literature support
Microfinance Borrowers (Explanatory Variable) /Reflective	Microfinance Category: 1. Treatment /Participant borrowers or 2. Control/ Non-participant borrowers	Microfinance presents small magnitude of financial services primarily micro-credit designed for borrowers living below poverty line (Robinson 2001).	Microfinance refers to small magnitude of microcredit designed for borrowers living below poverty line and beyond banking services (Mermod 2013). Participant borrowers mean who have taken microfinance based on their portfolio and completed at least one year, otherwise, non-Participant.	Category: Microfinance Institutes (In this case BRAC) give small loans to participant borrowers for alleviating poverty through revenue generating activities.	Adapted from Mosley (1997), Armendáriz & Morduch (2010).	(Robinson 2001), (Mermod 2013)
Poverty (Dependent Variable) /Reflective	Borrowers' Poverty measured by the following four (4) items.	Poverty is a state or condition in which a person or community lacks resources essential for minimum life standard and living below national poverty line (J. Chen, 2019). Hagenaars and De Vos (1988) defined poverty as a feeling that people do not have enough to get along.	Poverty is measured in relative term (Change in borrowers' poverty position) rather than in absolute term (Mokhtar, 2011). It is done by different poverty variables (e.g. business revenue, fixed assets, etc. of participant and non-participant borrowers through five point Likert scale (Likert, 1974).	Items are developed from different poverty variables (e.g. business revenue, fixed assets, etc.) at business, household, individual and security level with in line with HEPM Model (M. Chen & Dunn, 1996).		(J. Chen, 2019), Hagenaars & De Vos (1988)
	A. Business Level	Borrowers' poverty need to be measured at their business, household, individual and security level in line with HEPM Model (M. Chen & Dunn, 1996)	Microfinance made positive impact on the microenterprise revenue and employment (Dunn & Arbuckle, 2001a). The profitability and growth of business are correlated with the growth of its fixed assets and employment.(Hossain & Diaz, 1997; Islam, 2007)	1. Business Revenue: How much you agree that your business revenue has been increased.	Adapted from Mokhtar (2011)	Dunn & Arbuckle (2001a).
				2 Fixed Asset: How much you agree that your fixed asset has been increased.	Adapted from Mokhtar (2011)	Hossain & Diaz (1997), Islam (2007)
				3. Current Asset: How much you agree that your current asset has been increased.	Self - Developed	Hossain & Diaz (1997), Islam (2007).
				4. Employment: How much you agree that your employment has been increased.	Adapted from Mokhtar (2011)	Dunn & Arbuckle (2001a).

Appendix 2. Continued

Construct/Type	Variable	Conceptual definition	Operational definition	Measurement Item	Technique of development	Literature support
Poverty (Dependent Variable) /Reflective	B. Household Level	Borrowers' poverty need to be measured at their business, household, individual and security level in line with HEPM Model (M. Chen & Dunn, 1996)	Microfinance increased house quality, number of appliance, household land, firming land and number of livestock as well (Coleman, 2002; Dunn & Arbuckle, 2001a; Khandker, Samad, & Khan, 1998; Nader, 2008). The household income also raised the borrower's expenditure (Khandker, 2005; Zaman, 1999).	1. Household Income: How much you agree that your household income has been increased.	Adapted from Mokhtar (2011)	(Coleman, 2002; Dunn & Arbuckle, 2001a; Khandker et al., 1998; Nader, 2008).
				2. Immovable Property: How much you agree that your immovable property has been increased.	Self -Developed	-
				3. Movable Property: How much you agree that your movable property has been increased.	Self - Developed	-
				4. Expenditure: How much you agree that your expenditure has been increased.	Adapted from Mokhtar (2011)	(Khandker, 2005; Zaman, 1999)
	C. Individual Level	Borrowers' poverty need to be measured at their business, household, individual and security level in line with HEPM Model (M. Chen & Dunn, 1996).	Revenue generated from the business made the borrowers contributing to the household. This caused rise in borrower's self-esteem (Woller & Parsons, 2002). The growth in the business increased the borrower's effectiveness in coping with unfavorable shocks (M. Chen & Dunn, 1996; Dunn & Arbuckle, 2001b).	1. Control: How much you agree that your control over the situation has been increased.	Adapted from et al. (2011)	Chen & Dunn (1996), Dunn & Arbuckle (2001b)
				2. Honour: How much you agree that your honor has been increased.	Adapted from Mokhtar (2011)	Woller & Parsons (2002)
				3. Capacity: How much you agree that your capacity has been increased.	Self - Developed	Chen & Dunn (1996), Dunn & Arbuckle (2001b)
				4. Confidence: How much you agree that your confidence has been increased.	Adapted from Mokhtar (2011)	M. Chen & Dunn (1996), Dunn & Arbuckle (2001b)

Appendix 2. Continued

Construct/Type	Variable	Conceptual definition	Operational definition	Measurement Item	Technique of development	Literature support
Poverty (Dependent Variable) /Reflective	D. Security Level	Borrowers' poverty need to be measured at their business, household, individual and security level in line with HEPM Model (M. Chen & Dunn, 1996).	Microfinance impact indicators include improvements in health, nutrition, education, food security, quality of housing, infant mortality, gender disparities and women empowerment, self-esteem and respect (Epstein & Crane, 2005; Kabeer, 2005).	1. Social: How much you agree that your social security has been increased.	Self - Developed	Reddy & Manak (2005)
				2. Financial: How much you agree that your financial security has been increased.	Adapted from Al Mamun et al. (2011)	Al Mamun et al., (2011)
				3. Food: How much you agree that your food security has been increased.	Self - Developed	Epstein & Crane, (2005) (Kabeer, 2005)
				4. Health: How much you agree that your health security has been increased.	Self - Developed	Epstein & Crane (2005), Kabeer (2005)

Appendix 3. Some reference value for PLS-SEM modeling

1. Measurement Model

Assessment	Name of Index	Definition	Reference Value
Internal Consistency	Composite Reliability (CR)	It measures items within the construct have similar range and meaning	CR > 0.7-0.9 Satisfactory (Hair et al. 2016)
Convergent Validity	Factor Loadings (FL)	It denotes the proportion of indicators variance that is explained by the latent variable.	FL > 0.40 Adequate (Hulland 1999)
	Average Variance Extracted (AVE)	It is the grand mean value of the squared loadings of all indicators associated with the constructs.	AVE > 0.50 Adequate (Hair et al. 2016)
Discriminant Validity	Heterotrait-Monotrait Ratio (HTMT)	It refers to the ratio of correlation within the constructs to the correlation between the constructs	HTMT Ratio < 0.90 Conservative (Gold et al. 2001)

2. Structural Model

Assessment	Name of Index	Definition	Reference Value
Lateral Collinearity	Variance Inflator Factor (VIF)	It deals with the collinearity problem.	VIF > 0.50 (Hair et al. 2016)
Path Coefficient	Path Coefficient	It is the beta coefficient.	P < 0.05 (α = 5%)
Co-efficient of Determination	R^2	It measures model's predictive accuracy.	R^2>0.67, 0.33, 0.19; high, moderate, week respectively (Chin et al. 2003)
Effect Size to R^2	f^2	It assesses how strongly one exogenous construct contributes to explain endogenous construct in terms of R^2	f^2 > 0.35, 0.15, 0.02; high, moderate, week respectively (Cohen 1988)
Predictive Relevance	Q^2	It indicates whether exogenous constructs have predictive relevance for endogenous constructs.	Q^2 > 0 (Hair et al. 2016)